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THE BIRDS OF SOCOTRA AND ABD-EL-KURI
(With 8 Plates)

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INTRODUCTION

SOCOTRA (locally spelled "Soqotra") is the largest island in an archipelago lying 120 miles east of the "Great Horn of Africa" and about 300 miles south of the Arabian coast. Not until the latter part of the nineteenth century did exploring parties visit these islands with the special purpose of investigating their fauna.

The earliest expeditions, conducted by Professor I. B. Balfour of Glasgow University in 1879-80 and by two German scientists, Dr. Riebeck and Dr. Schweinfurth, in 1881, made extensive natural history surveys and collections on Socotra. These explorations were the first to direct attention to the unusual avifauna of this island. An annotated list of the birds collected by Balfour was published by Sclater and Hartlaub (1881) and a similar list covering the birds collected by Riebeck was published by Hartlaub (1881).

In 1888, the archeologist Theodore Bent visited Socotra. One of the members of his party, E. N. Bennett, made collections in several groups of zoology, including birds. During the winter of 1898-99, Henry O. Forbes of the British Museum and W. R. Ogilvie-Grant of the Liverpool Museums undertook a joint expedition to study the natural history of Socotra and Abd-el-Kuri. Later, Forbes (1903) compiled and edited a report upon this expedition. Ornithological notes and specimen records of the Bent expedition are included in Forbes' report. (Reference will be made in the present paper to the specimens collected by Ogilvie-Grant and Forbes and to the endemic species and subspecies which they described.) Since the publication of Forbes' monograph on the natural history of the islands, there have been no major contributions to the ornithology of Socotra and many aspects of the life history, ecology, and distribution of its avifauna have remained unknown.

In 1964, the Smithsonian Institution commissioned Alec D. Forbes-Watson of Nairobi, Kenya, to undertake an ornithological survey of this interesting and little-known archipelago. This expedition, consisting of Forbes-Watson and two Turkana bird-skinners from Kenya, left Aden in early March and returned in mid-June of that year. During the 15 weeks spent on Socotra and on several of its neighboring islands, the party collected over 500 bird specimens, representing a total of 42 species. Forbes-Watson also collected a small number of reptiles and mammals but, unfortunately, the reptile specimens and all but a few mammal skins were stolen before the expedition returned to Aden.

This paper is a report by the authors on the bird specimens collected by Forbes-Watson during this expedition. Direct quotes attributed to him are taken from his field notes. All photographs also were taken by Forbes-Watson.

ACKNOWLEDGMENTS

Forbes-Watson received permission for the expedition to enter Socotra through the gracious kindness of His Highness the Sultan of Quishn and Soqotra, Issa Ali el Afreer. In many practical matters, his Chief Wazir, Sheik Ibrahim Khalid, provided helpful services and offered his friendly cooperation to the party on a number of occasions.

The relative inaccessibility of Socotra presented a major difficulty in arranging transportation for the expedition to and from the island. The party received much needed assistance in this critical matter through the generous cooperation of Air Vice Marshall Johnson, Air Officer Commanding, R.A.F., Aden, who provided them with air transport to and from the Hadibu airstrip.

Many other arrangements and plans associated with the undertaking were fraught with vicissitudes of the most trying nature. Without the help of a number of persons, the expedition could not have achieved success. In this regard, Forbes-Watson wishes to express his deep appreciation to the following: *In Kenya*: Mr. and Mrs. Nat Kolfsky, Anna Kolfsky, Myles North, John Williams, and the taxidermists Abilahi Loriu Lokiru and Loriu Lokiru. *In Aden*: Major and Mrs. Rose, Brian Doe, Arthur Watts. *In Socotra*: Whitney Straight and members of the Desert/Mountain Rescue Team. The present authors wish to express their deep appreciation to the authorities of the British Museum (Natural History), the American Museum of Natural History, the Peabody Museum of

Natural History, and the Field Museum of Natural History (Chicago), through whose cooperation comparative material was made available for study.

ITINERARY

March 7-15	Set up base camp at Hadibu Town
March 16-18	Traveled by dhow along coast eastward from Hadibu
March 19	Kallansiya
March 20-22	Traveled to Abd-el-Kuri by dhow
March 23	Visited the outlying islands of Kaal Firaon and Jazirat Sabuniya
March 24-25	To Hadibu via Kallansiya by dhow
March 26-April 1	Hadibu
April 2-3	Reconnaissance to Kishin
April 4-9	Hadibu
April 10-May 13	Kishin—base camp from which study of Hagg hier Mountains was made
May 16-22	Hadibu
May 23-30	To Kallansiya by camel
May 31-June 7	Qaysuh—base camp set up here while studying west end of island
June 8-11	To Hadibu by camel
June 12-14	Hadibu

GEOLOGY AND PALEOGEOGRAPHY

Socotra, Abd-el-Kuri, and several of the islets between are formed of granite capped with limestone. Along much of the coastline, the granitic base rock rises sheer from the sea, but here and there, particularly at the mouths of rivers, it is indented by extensive coastal plains. On Socotra, the limestone plateau is interrupted by the Hagg hier massif, which rises on the northeastern coast to an altitude of just under 5000 feet. The limestone plateau extends east, south, and west from the main peaks at an average altitude of 1500 feet. Geologically, Socotra resembles the Somali Plateau; thus, it appears to be a remnant of the land bridge that connected the mainland of Africa to southwestern Arabia from the Late Cretaceous to Early Miocene times. Later submergence is indicated by deposits of limestone that have been determined to be Eocene on the basis of a number of molluscs and echinoids identified from this formation. Collections of volcanic rocks have been made on Socotra, and Gregory (1903, p. 580) postulates the island has been involved in the same volcanic movement that formed the Gulf of Aden.

Regarding the emergence and submergence of the land during successive periods of alteration in sea level in past ages, Gregory

(1903, p. 578) quotes T. G. Bonney: “. . . the topmost peaks of the Haggier Mountains were at no time wholly submerged. . . . in the Haggier Hills, we have probably a fragment of a continental area of great antiquity and of a land surface which may have been an ‘arc of refuge’ to a terrestrial fauna and flora from one of the very earliest periods in the world’s history.”

GEOGRAPHY AND CLIMATE

The archipelago of which Socotra is the largest island is situated in the Indian Ocean and is located between latitudes 12° and 13° N and longitudes 52° and 55° E. Latitude $53^{\circ}55'E$ and longitude $12^{\circ}30'N$ intersect near the center of the main island. Socotra is 85 miles from east to west and 25 miles across at its widest point. Although within sight of two main shipping lanes, Socotra is seldom visited by ships and there is no regular means of transportation to the island. This is due partly to the fact that there is no harbor, but mainly to the fact that, because very strong winds blow for about half the year, ships are warned to keep at least 40 miles away.

Most of the island is harsh, dry, and scrubby, relieved only here and there by oases near the infrequent water holes. Hadibu, located on the north coast, is the capital. It has a population of about 8000 Arabs in addition to Africans of slave descent. The chief occupation of the inhabitants, with the exception of the ruling Arab classes, is stock-raising, fishing, and pearling. The interior is populated chiefly by Bedu herdsmen.

The expedition performed a considerable amount of its work at or near Hadibu. Forbes-Watson gives a graphic description of the surrounding plain in his field notes :

The Hadibu Plain is about six miles long and up to three wide. The sea-shore is mostly very pebbly, although there is a sandy beach near Suk, and some worn coral reefs are exposed at low tide especially as continuations of the minor promontories. These reefs are particularly attractive to migrant waders. The coast to the west of Hadibu is steeper and consists of earth cliffs about 20 feet high rising immediately behind the pebbly beach. Inland the plain consists of pebbles or gravel covered with a more-or-less thick boxwood scrub, this being thicker and taller the nearer it is to the foothills. There are one or two small hills, notably Hasun, south of Hadibu, where there are the remains of an Arab fort. Three main watercourses cross the plain, at Suk, Hadibu, and halfway between. These do not normally reach the sea, and in each case there is a sand-bar which prevents the fresh and salt-water from meeting (the fresh water is a few feet higher than the sea). The courses and lagoons are bordered by extensive date plantations, and the drier parts of the watercourses often have small rocky cliffs a few feet in height, otherwise the plain is rather flat and unbroken. To the west of the central river, and lying behind the beach, parallel

to the sea, is a flat depression, which is periodically flooded by rains. Inland from this is an extensive bare plain, which, further inland, becomes better covered by small twiggy bushes a foot or two in height.

Immediately behind and south of the Hadibu Plain rise the pink granite cliffs of the Haggier Mountains, which provide an impressive backdrop to Hadibu Town. Jebel Hajr, the tallest pinnacle, has an elevation of 4931 feet.

The second largest island is Abd-el-Kuri, which lies about midway between Socotra and the African coast. Less than 3 miles across at its widest point, it stretches about 20 miles from east to west. There is no surface water but there are a few brackish wells. This island supports a small population of pearlers.

Several other rocks and islets complete the archipelago. The Brothers are both flat topped with sheer sides. Jazirat Samha rises to 2557 feet and Jazirat Darsa to 1285 feet. Jazirat Sabuniya is a guano-whitened islet consisting of three peaks. It lies about 11 miles northwest of Socotra. Kaal Firaon consists of two bare guano-covered rocks separated by a narrow water-gap of surging current. Both islets are about 280 feet high.

Socotra falls within the Semiarid Tropical type climate of Thornthwaite (1933, p. 440). It is tempered by the northeast and southwest monsoon and is less torrid than the adjacent mainland. The dry southwest monsoon begins toward the end of May and the rainy season commences with the northeast monsoon in September. Highest precipitation is in November and December. Heat and humidity rise during the period of calm between monsoons. (Popov, 1957, p. 709).

Forbes-Watson describes his experience at the approach of the dry, summer monsoon:

. . . there were heavy rain showers in each month, but each was of a very short duration. Even the Turkana skimmers, who came from one of the hottest parts of Kenya, complained about the heat at mid-day. By the end of May the monsoon had started, and was strongest in the west, so much so that the tent had to be pitched in a pit or it would have blown away. Even so, it was ripped across, though the tent was new.

FLORISTIC AND FAUNAL RELATIONSHIPS

According to Good (1947, p. 38), Socotra belongs floristically to the Northeast African Highland and Steppe Region. In addition to a considerable element of tropical African affinity, it also contains a number of types more characteristic of the Northern Tem-

perate Region. The vegetation of Socotra is considered by Pichi-Sermolli *et al* (1958) to belong to the Subdesert Steppe-Tropical type.

After studying a collection of plants from Socotra, Balfour (1903, p. 450) observed:

It will be seen then that the new evidence brought by the expedition bearing upon the character and relationships of the Sokotran flora bears out the conclusions that have been based upon the plants previously brought from the island. The African—especially Abyssinian and Somaliland—connection is supported, the bonds with the opposite Asiatic mainland are strengthened, and most interestingly, the remarkable East Indian relationship receives a further illustration.

Harrison (1964, vol. 1, p. 5), in his study of the mammals of that area, places eastern Socotra in the Saharo-Sindian Zoogeographic Zone and western Socotra in the Tropical Ethiopian.

From the standpoint of bird distribution, Chapin (1932, p. 90) places Socotra in the Ethiopian Zone, Somali Arid District.

CHARACTERISTICS OF ISLAND BIRDS

Speciation in *Fringillaria* and *Onychognathus*

The genus *Fringillaria* is represented on Socotra by two species, *F. socotrana* and *F. tahapisi*. The presence of these two closely related species occurring together as residents of the same island may be accounted for in the following manner: Assuming that both *F. socotrana* and *F. tahapisi* evolved from a common progenitor on the African mainland, it must follow that both of these species were separated from one another by geographic barriers for a considerable length of time. The island originally may have been colonized by a wave of *Fringillaria* from the mainland. At a later date, a second wave of migrants arrived—but not before certain biological isolating mechanisms had become fixed in the pioneer species. The endemic, *F. socotrana*, is a monotypic species and has no representatives on the mainland. We may assume therefore that it arrived first (following the reasoning of Ripley, 1949, p. 154, in parallel cases among Indian birds). At a much later date, the island was colonized by another wave of migrants—the more widespread and adaptable species *F. tahapisi*.

It seems reasonable to assume that the sympatric distribution of *Onychognathus* may be accounted for in a similar manner. The fact that *O. frater* is an endemic species with no relatives on the mainland suggests that it also was a pioneer species. The monotypic species *O. blythii* is represented by populations on Socotra as well as on

the mainland but, unlike *Fringillaria tahapisi*, it is not phenotypically separable.

A variety of isolating factors such as differences in habit, voice, and feeding niche requirements serve with varying degrees of significance to restrict random mating between closely allied forms. In this connection, Forbes-Watson has made the following observations which illustrate some of the factors that limit competition on an inter-specific level in both *Fringillaria* and *Onychognathus*.

Fringillaria species.—The commoner bird, *F. tahapisi*, is found from sea-level to at least 3000 feet, wherever an outcrop of rock forms a small scarp—such as along the edge of a dry gully—and in other areas, where the right combination of rock and feeding-grounds occur. In such situations it is found near thickets, but it has never been seen in them, whereas *F. socotrana* does occur in thickets, and also has been seen feeding on narrow ledges on rock-faces where *tahapisi* was not found. It appears that nonbreeding flocks of *socotrana* descend from the heights and forage socially at a much lower altitude than *tahapisi*, which was uncommon here. The two species were not seen together, but it is unlikely that *tahapisi* would favor the open slopes where the rarer bird was found. When *tahapisi* was seen feeding in flocks, it was invariably found in gullies, dry water-courses, and on more thickly covered hillsides, and, when disturbed, it flew fairly far away; the rarer bird was tamer and, when flushed, flew only a short distance before settling.

The calls of the two birds differ, that of *socotrana* being noted down as a high thin whistle (sometimes repeated two or three times), followed by a soft gurgle: “tseep . . . guruguruguru.” This first note is higher and thinner than the “seeoo” call of *Zosterops* and does not fall as does that call. The call of *tahapisi* is a soft metallic “jingling” song of quite different character.

On the ground, *socotrana* stands higher than *tahapisi*, which usually squats rather flat on the ground; also *socotrana* perches rather more freely than the other bird. The preference of *socotrana* for thickets and scrub points to a relict ecological tolerance for greater density of vegetation perhaps correlated with slightly increased moisture and more ample vegetation—in the view of the present authors.

Onychognathus species.—The two starlings were often seen together, but, except when feeding on ripening figs, have different feeding-habits, *O. frater* acting more like a thrush. The call of *frater* is softer and more whistled than that of *blythii*, though the

alarm calls of both are similar, the typical harsh grating calls of the genus.

O. frater appears to be a shyer, quieter bird, and is less conspicuous. It was seen to obtain its insect food rather more from within a bush than on it and was never seen on the ground in the open nor associating with stock, whereas *blythii* is a bolder more obvious bird, more prone to flock, and is often associated with stock—cattle, donkeys, goats, and sheep—often perching on their backs but not actually feeding on them, apparently merely using them as beaters.

Here again, as in *Fringillaria socotrana*, the presumed earlier invader, *O. frater*, displays a relict ecological tolerance for slightly less arid conditions, a moister phase with more ample vegetation.

Plumage

Four monotypic species of passerine birds are endemic to Socotra. With two exceptions, the general aspect of these species is one of paleness, greyiness, or general drabness of plumage. The two strongly colored endemic species, *F. socotrana* and *O. frater*, have a sympatric distribution on the island with their closely related, non-endemic congeners, *O. blythii* and *F. tahapisi*. Even in this instance, the strong coloring and bold wing pattern of the endemics are reduced in intensity when compared with the nonendemic species. In addition to this, the sexual dimorphism exhibited by *O. blythii* (the females have grey heads) does not occur in the endemic *O. frater*. One polytypic species, *Passer insularis*, is found only on Socotra and Abd-el-Kuri and is represented on these islands by the geographical races *socotranus* and *insularis*. (In *P. insularis*, the Abd-el-Kuri form is paler than the race on the main island.)

Eleven species of Socotran birds, which differ in coloration from their mainland counterparts, are considered to be endemic subspecies. Again, with accountable exceptions, the Socotran forms are characterized by paleness or a reduction of color in the plumage. Only *Apus pallidus berliozi* is darker than the adjacent mainland subspecies *A. p. somalicus*. It is, however, considerably paler than the North African form *brehmorum* and may, indeed, have arisen from this stock rather than from the Somaliland population.

Another resident, *Rhynchostruthus socotranus socotranus*, is more boldly patterned about the head and neck than either of the other races in Somaliland or southwestern Arabia. This species is, however, a puzzling one and presents other problems as well. There is nothing in Africa or Europe that resembles it and its affinities are

thought to be closest to some of the Himalayan cardueline finches (see also page 33).

In a recent study on the plumage of passerine birds on the Tres Marias Islands, Mexico, Grant (1965, p. 52) suggests that drabness originates as a by-product of the genetic reorganization of a population in the early stages of island colonization and, although there is no intrinsic value in this feature, its significance lies in the fact that islands have a small number of species; hence, the need for specific distinctiveness in that environment is, in many cases, reduced.

Size

Apus pallidus berliozii has a longer wing than its nearest counterpart on the mainland. *Lanius elegans uncinatus* has a longer and thinner bill than *archeri* of Arabia. Wing measurements of the remaining endemic subspecies on Socotra all fall within the range of their closest allies on the mainland, although wing measurements of Socotran birds fall off in the upper ranges, thus reducing their averages somewhat. (This also applies to *Passer insularis hemileucus* of Abd-el-Kuri in relation to the nominate race on Socotra.)

Based on this evidence, it may be said that most Socotran races average smaller than their mainland counterparts although the difference is slight and the trend is not without exception.

Family PROCELLARIIDAE: Petrels, Shearwaters

Puffinus leucomelas (Temminck): White-faced Shearwater

"Recorded in April from seas just east of Socotra"—Macworth-Praed and Grant (1952, ser. 1, vol. 1, p. 13).

Bulweria fallax Jouanin: Jouanin's Gadfly Petrel

The type of Jouanin's gadfly petrel was taken near Socotra (12°30'N, 55°E) by G. Cherbonnier on June 20, 1954. This species is found commonly throughout the year in the Arabian Sea and the Gulf of Aden. It probably breeds in burrows on Socotra, Abd-el-Kuri, and the Kuria Muria islands off eastern Aden, possibly from October to March. While at sea, it feeds alone, often far from land. It is described as a lightly built, small, brownish-black gadfly petrel with a long, wedge-shaped tail and a short, thick bill. The feet are flesh colored with black outer edges to the legs and toes. Forbes-Watson saw a number of petrels as he was traveling by dhow from Socotra to Abd-el-Kuri but was unable to collect any of these birds.

Family PHAETHONTIDAE: Tropic-birds

Phaethon aethureus indicus Hume: Red-billed Tropic-bird

Three or four were seen flying near Jazirat Sabuniya. One was heard screaming near the top of the islet and was caught by hand. It proved to be such a strong flyer that it escaped and flew out to sea. It is likely they were about to start breeding.—A. D. Forbes-Watson.

Family SULIDAE: Boobies, Gannets

Sula dactylatra melanops Heuglin: Masked Booby

PLATE 3 (top)

This species was seen on Socotra only in the vicinity of Kallansiya and was not common there. It was commoner along the north coast of Abd-el-Kuri, but most were seen on, and in the water near, Kaal Firaon and Jazirat Sabuniya, where they were nesting in March. There were possibly 100 pairs altogether, and breeding was in all stages. Several clutches of eggs were seen and four slightly-incubated sets were collected. There were also young of various ages, mostly one per pair of adults, but in several cases two very young birds occupied the same nest. No attempt at building was made, the eggs being laid in a depression in the rock. Sometimes a few gravel chips were present. About twenty percent of the flying birds near the islets were in dark immature dress, a much lower proportion than at sea or near Abd-el-Kuri, where it was around fifty percent.

Half-digested fish remains were seen at a nest containing two eggs, over which one of the parents was standing. A small gecko was seen on one of the eggs just below the belly of the booby. It was observed taking mouthfuls of the rotting fish. The booby did not seem to mind the intruder.—A. D. Forbes-Watson.

Sula sula sula (Linnaeus): Red-footed Booby

Ogilvie-Grant and Forbes (1903, pp. 50, 62) reported large flocks from the seas around Socotra and Abd-el-Kuri.

Sula leucogaster leucogaster (Boddaert): Brown Booby

Ogilvie-Grant and Forbes (1903, p. 62) obtained several specimens on Abd-el-Kuri.

Family PHALACROCORACIDAE: Cormorants

Phalacrocorax nigrogularis Ogilvie-Grant and Forbes:
Socotra Cormorant

Of this species, previously unrepresented in the National Museum Collection, two specimens were taken by Forbes-Watson at Kallansiya, west end of Socotra, June 2. A female adult, in rather fresh sooty plumage has a wing measurement of 284 mm.; an immature bird of

undetermined sex, 290 mm. Soft parts: iris dark emerald green; eyelid blackish with yellowish warty excrescences; bare facial skin blackish with grey ridges; bill black with yellowish sides, base dull grey green. Gular skin brown to grey-tinged green. Feet black, pinkish on joints; webs black; toes pink. Immature: iris dull greyish; eyelid yellowish pink; facial skin yellowish tinged green. Bill grey green, yellowish at base and sides; gular pouch pinkish, yellowish near base of bill. Feet dull greyish, paler on sides; webs dusky shading to pinkish near the toes. Stomach contents: fish.

This species was seen on all of the four islands visited by Forbes-Watson, but on Socotra it was recorded only from Ras Hebak and westward to Ras Bidu, where Ogilvie-Grant and Forbes (1903, p. 50) noted it also. Neither the two specimens collected in June nor the seven collected near Ras Bidu in March (which, unfortunately, could not be preserved) had enlarged gonads. Surprisingly, Forbes-Watson found little or no evidence of breeding activity by this species on Socotra or the outlying islands during his stay.

The following comments are taken from his field notes:

They were also seen along the north coast of Abd-el-Kuri and on Kaal Firaon and Jazirat Sabuniya. It seems unlikely that any actually bred on the islands—if any do breed there, probably only a few do so. Those pale-bellied young birds seen on Jazirat Sabuniya were probably not bred locally. No adults were seen after March, all the birds seen subsequently near Kallansiya and Qadhub being in immature dress. Presumably the rest had left for Arabia.

Hartlaub (1881, p. 957) lists a specimen of *P. carbo* collected by Reibeck near Hadibu. There is a possibility that this was a misidentification based on the fact that young birds of both *nigrogularis* and *carbo* have the underparts extensively whitish.

Family ARDEIDAE: Herons

Ardea cinerea cinerea Linnaeus: Grey Heron

Hérons were seen singly and in pairs near Hadibu, Qadhub, Goba, and the sand expanse north of Kallansiya. No sign of breeding was seen, although birds were seen in all months (March–June).

Ardea purpurea purpurea Linnaeus: Purple Heron

One pair was seen fishing among the mangroves at Goba in May. A single immature specimen was collected by Ogilvie-Grant and Forbes (1903, p. 53) near Hadibu.

***Butorides striatus* subspecies?: Green-backed Heron**

These birds were seen on two or three occasions in March on the rivers near Hadibu. Green-backed herons have not been recorded previously on Socotra.

***Bubulcus ibis ibis* (Linnaeus): Cattle Egret**

This widespread species may be added to the Socotra list on the basis of a single bird seen by Forbes-Watson near Kallansiya in early June.

***Egretta garzetta garzetta* (Linnaeus): Little Egret**

Forbes-Watson recorded a single bird seen on two occasions on Kallansiya lagoon in early June. This is the first record for Socotra.

***Egretta gularis schistacea* (Hemprich and Ehrenberg): Reef Heron**

Four or five reef herons, in both white and dark phases, were noted on the exposed reefs near Hadibu in March. All had left by April. Sclater and Hartlaub (1881, p. 173) list this species for Socotra, based on a pair of wings brought back by Balfour.

Family THRESKIORNITHIDAE: Spoonbills

***Platalea leucorodia* subspecies?: Spoonbill**

Sclater and Hartlaub (1881, p. 173) mention spoonbills having been seen by Balfour on the margins of stagnant pools near the villages on the north coast. Mackworth-Praed and Grant (1952, ser. 1, vol. 1, pp. 78, 79) say both *P. l. leucorodia* and *P. l. archeri* Neumann occur but do not say who obtained them.

Family PHOENICOPTERIDAE: Flamingos

***Phoenicopterus roseus* Pallas: Flamingo**

The Bent expedition of 1888 obtained one specimen and recorded "quantities of Flamingos on the beach" (Ogilvie-Grant and Forbes, 1903, p. 52). Forbes-Watson saw 12 birds, presumably of this species, near Qadhub at the end of May, 5 on the sandflats near Kallansiya on several occasions in June, and 1 was seen flying eastward from Hadibu in mid-June.

Family ANATIDAE: Ducks

***Anas crecca crecca* Linnaeus: Common Teal**

Balfour reports these birds to be "specially prevalent on the Debeni River and Khorfariah" (Sclater and Hartlaub, 1881, p. 173).

***Anas platyrhynchos* Linnaeus: Mallard**

Ogilvie-Grant and Forbes (1903, p. 51) report that Bennett collected a mallard on Socotra, but neither they nor Forbes-Watson met with it there.

***Anas strepera strepera* Linnaeus: Gadwall**

Ogilvie-Grant and Forbes (1903, p. 51) list this species as being fairly common on the brackish estuaries of the rivers traversing the Hadibu Plain and in the swamps near Khor Garieh.

***Anas penelops* Linnaeus: Wigeon**

The 1898-99 expedition found the wigeon fairly common about the mouths of the rivers near Hadibu and met with large flocks in a patch of marshy ground bordering the Dimichiro River near its entrance into Khor Garieh (Ogilvie-Grant and Forbes, 1903, p. 52).

***Anas querquedula* Linnaeus: Garganey**

A female was taken on a lagoon 2 miles east of Hadibu on March 10 by Forbes-Watson. Weight 100 gms. This species has not been recorded previously in passage on Socotra.

***Aythya nyroca* (Güldenstädt): White-eyed Pochard**

Riebeck shot a female at Kallansiya (Hartlaub, 1881, p. 956). The Forbes' party encountered a small flock swimming in a brackish estuary of the Wadi Dinehan, but none were collected (Ogilvie-Grant and Forbes, 1903, p. 52).

Family ACCIPITRIDAE: Hawks, Vultures

***Buteo buteo* subspecies?: Buzzard**

PLATE 3 (bottom)

Ogilvie-Grant and Forbes (1903, p. 48) found this species nesting on Socotra and secured several specimens. Forbes-Watson noted these birds occasionally on the Hadibu Plain, the cliffs near the sea, and in the limestone country to the east of Kallansiya. In the Haghiers, he observed a pair carrying sticks to a nest on a cliff opposite Kishin camp. The nearest population of breeding *Buteo buteo* occurs in northern Iran, where *menetriesi* Bogdanov is the resident form. In an attempt to determine the racial affinities of the Socotran population, four specimens of *Buteo buteo* from Socotra were borrowed from

the British Museum. With one exception, mensural differences fell within the range of *vulpinus* (Gloger), a race which occurs generally to the north of *menetriesi*, but individual variation in color was so pronounced in the small series that a positive racial allocation could not be made. It appears likely from the variation in bill measurements among those specimens measured that northern migrant buzzards may have been included in our series. The single specimen with an exceptionally large bill (adult male, Sept. 3, 1934, culmen from cere 26.5 mm.) could perhaps have been a resident specimen indicating the presence of a large, island form.

***Neophron percnopterus percnopterus* (Linnaeus): Egyptian Vulture**

PLATE 4 (top)

One of the most obvious birds on Socotra, but not seen on Abd-el-Kuri, although birds were seen on the extreme western point of Socotra at the nearest point to that island. They were quite bold and common—as many as 24 were seen at one time at Hadibu. One pair had a nest below Kishin camp at about 1,500 feet altitude, which was placed in a horizontal crack in a smallish block of granite. There was evidently at least one young, as the parents collected skinned-out bird bodies at Kishin and took them off down the valley in their bills. About half of the birds seen were in brown non-adult plumage.—A. D. Forbes-Watson.

***Circus aeruginosus* subspecies?: Marsh Harrier**

Forbes-Watson saw a single individual on two or three occasions in March flying over the lagoon at Hadibu.

***Pandion haliaetus haliaetus* (Linnaeus): Osprey**

Forbes-Watson found ospreys to be common on Socotra and Abd-el-Kuri, but no nests were seen. A dead osprey was found on Kaal Firaon. Ogilvie-Grant and Forbes (1903, p. 61) collected a pair on Abd-el-Kuri.

Family FALCONIDAE: Falcons

***Falco biarmicus* subspecies?: Lanner Falcon**

Regarding the occurrence of this species on Socotra, Forbes has this to say: "I saw a pair of Falcons, apparently Lanners, on the slopes of Dimimi, a mountain in the Hagghier range to the southward of our camp at Dahamis A second pair were seen on the wing in the Dimichiro Valley, but these kept at a safe distance" (Ogilvie-Grant and Forbes, 1903, p. 47).

***Falco peregrinus* subspecies?: Peregrine Falcon**

Balfour obtained one specimen near Hadibu (Sclater and Hartlaub, 1881, p. 172). Forbes-Watson recorded a peregrine on two occasions near Hadibu. In early May, a pair was seen at 4000 feet in the Haggghiers. They were calling to each other as they circled and may have been nesting.

***Falco tinnunculus archeri* Hartert and Neumann: Kestrel**

Three males and four females were collected near Hadibu from March 9 to May 20. A male and female were taken in the Haggghier Mountains on April 17. Both males and females averaged about 100 gms. in weight. Soft parts: iris brown; eye-ring yellow; bill blue grey, base yellowish; feet yellow; cere yellow; claws black. Stomach contents: grasshoppers in all except one, which contained a lizard. Gonads were small or undeveloped except for one male collected March 9, which had testes slightly enlarged. No nesting was noted although the birds seem to be resident. In both size and color, the Socotran population is inseparable from the Somali race *archeri*.

Family PHASIANIDAE: Quails

***Coturnix coturnix coturnix* (Linnaeus): European Quail**

Forbes-Watson saw only one *Coturnix* near Suk at the end of March. Ogilvie-Grant and Forbes (1903, pp. 57, 63) report only a few from Socotra and Abd-el-Kuri. There was no evidence of breeding.

***Coturnix delegorguei delegorguei* Delegorgue: Harlequin Quail**

Mackworth-Praed and Grant (1952, ser. 1, vol. 1, p. 266) list the harlequin quail as occurring on Socotra.

Family RALLIDAE: Rails, Coots

***Porzana porzana* (Linnaeus): Spotted Moorhen**

Ogilvie-Grant and Forbes (1903, p. 56) list a specimen collected by Bennett on Socotra.

***Gallinula chloropus chloropus* (Linnaeus): European Moorhen**

Riebeck (Hartlaub, 1881, p. 957) obtained five adult specimens of this species but did not indicate the exact locality.

Family CHARADRIIDAE: Plovers, Sandpipers, Snipe

Subfamily CHARADRIINAE: Plovers

Pluvialis squatarola (Linnaeus): Grey Plover

One female in winter plumage collected near Hadibu on March 13 has the iris brown, bill black, and feet black. Stomach contents: small snails and grit. Weight 100 gms. This species has not been reported previously from Socotra.

Pluvialis dominica fulva (Gmelin): Eastern Golden Plover

One specimen, a male, in summer plumage was collected 2 miles east of Hadibu on May 17. Soft parts: iris dark brown; bill black; feet dark greyish. Stomach contents: mollusc shell fragments and a caterpillar. Weight 100 gms. This is the first record of the golden plover from Socotra.

Charadrius hiaticula tundae (Lowe): Ringed Plover

One female was collected east of Hadibu on March 13. Soft parts: iris brown; bill black, orange yellow at base; feet pale orange. Weight 48 gms.

Although this Arctic migrant regularly visits the coast of East Africa, this is the first record for Socotra. Forbes-Watson records having seen others on Abd-el-Kuri in March.

Charadrius dubius curonicus Gmelin: Little Ringed Plover

One specimen, a female, was collected near Hadibu on March 9. Soft parts: iris brown; eyelid yellow; bill black with yellow spot on extreme base of lower mandible; feet pale yellow. Stomach contents: insects and grit. Weight 37 gms.

Charadrius alexandrinus alexandrinus Linnaeus: Kentish Plover

Both Ogilvie-Grant and Forbes (1903, p. 54) and Forbes-Watson collected this species on Socotra. The latter found this bird to be common and resident along the ponds and lagoons on the north coast. Eggs and young were noted from March to May. Seven males, five females, and three downy young were collected near Hadibu. Weight: males 34-40 gms.; females 32-39 gms.; downy young 9 gms. Soft parts of adults: iris brown; bill black; feet blackish; tarsus olive grey. Downy young: iris dark brown; bill blackish; feet pale green grey; bare skin on throat dull blackish. The stomachs of the adults contained grit and insect fragments.

Subfamily SCOLOPACINAE: Curlews, Sandpipers, Snipe

***Numenius phaeopus phaeopus* (Linnaeus): Whimbrel**

Forbes-Watson found a flock of seven birds on the rocks near the water's edge on Kaal Firaon.

***Numenius arquata* subspecies?: Curlew**

Forbes-Watson mentions this species in his list of birds seen on Socotra but gives no further data. Vaurie (1965, p. 424) states that migrants "south to east Africa" appear to be chiefly intermediate between nominate *arquata* and *orientalis* Brehm and cannot be identified with certainty as to subspecies.

***Limosa lapponica* subspecies?: Bartailed Godwit**

Forbes-Watson records having seen the bartailed godwit on Socotra. This is the first record for the island.

***Tringa totanus* subspecies?: Common Redshank**

Ogilvie-Grant and Forbes (1903, p. 54) found the redshank common on the rivers near Hadibu. It was not seen by Forbes-Watson.

***Tringa nebularia* (Gunnerus): Greenshank**

Ogilvie-Grant and Forbes (1903, p. 54) found the greenshank to be common at the mouths of the rivers traversing the Hadibu Plain. On March 13 Forbes-Watson collected a female 1 mile west of Suk. Soft parts: iris brown; bill blackish on tip, olive green at base; feet pale olive green, joints darker. Weight about 100 gms.

***Tringa glareola* Linnaeus: Wood Sandpiper**

A wood sandpiper was collected by Riebeck at Kallansiya (Hartlaub, 1881, p. 956). One specimen of this Palearctic migrant, a female, was taken near Hadibu by Forbes-Watson on March 11. Soft parts: iris brown; bill blackish; base of lower mandible greenish; feet green yellow; joints and toes greenish. Stomach contents: insect fragments. Weight 56 gms.

***Tringa hypoleucos* Linnaeus: Common Sandpiper**

This species was recorded from Abd-el-Kuri by Ogilvie-Grant and Forbes (1903, p. 54). Forbes-Watson collected two males near Hadibu on March 11 and 15. One specimen had the feathers of the

upperparts quite worn although the remiges showed signs of recent replacement and the rectrices were undergoing molt. Soft parts: iris brown; bill blackish; base grey green; feet greenish; toes more dusky. Stomach contents: insects. Weight 42 gms. The other specimen, in fresh summer plumage, had the iris brown, bill olive, base of lower mandible paler, feet pale olive. Stomach contents: insect fragments. Weight 60 gms.

***Arenaria interpres interpres* (Linnaeus): Turnstone**

Bennett secured one specimen on Socotra (Ogilvie-Grant and Forbes, 1903, p. 53). Forbes-Watson obtained one male and three females near Hadibu between March 9 and June 12. Soft parts: iris brown; bill blackish; base of lower mandible greyish; feet orange; joints dusky. One stomach contained small crabs. Weight from 87 to 100 gms.

***Capella stenura* (Bonaparte): Pintail Snipe**

Two examples of the pintail snipe were secured by Ogilvie-Grant and Forbes (1903, p. 55) at Homhil, Socotra. None were seen by Forbes-Watson.

***Capella gallinago gallinago* (Linnaeus): Fantail Snipe**

"It was common in the rushy edges of the stream below our camp at Homhil, and proved a welcome addition to our bill of fare"—Ogilvie-Grant and Forbes (1903, p. 55). This species was not seen in 1964.

***Calidris albus* (Pallas): Sanderling**

Forbes-Watson did not record the sanderling on Socotra although Bennett is credited with having obtained a specimen (Ogilvie-Grant and Forbes, 1903, p. 54).

***Calidris minutus* (Leisler): Little Stint**

Two males, representing new records for Socotra, were collected near Hadibu on May 17. Soft parts: iris brown; bill black; feet black. Stomach contents: insect fragments. Weight 20 gms.

***Calidris temminckii* (Leisler): Temminck's Stint**

Ogilvie-Grant and Forbes (1903, p. 54) report having shot a specimen from a flock feeding in the bed of the Hanefu River on Feb. 20, 1899. Forbes-Watson secured two males and one female

near Hadibu on March 9, 10, and 13. Replacement of the primaries was almost complete in all of these specimens. In the female, all of the primaries were new except the tenth, which was about half way out of the sheath. One male had replaced all but the ninth and tenth primaries while the other had the tenth half grown. Soft parts: iris brown; bill black; feet green yellow or olive green. Stomach contents: grit and small insects. Weight 20 to 23 gms.

Family DROMIDIDAE: Crab Plovers

Dromas ardeola Paykull: Crab Plover

Professor Balfour found the crab plover common at Kallansiya (Sclater and Hartlaub, 1881, p. 174), but neither of the later expeditions record it.

Family GLAREOLIDAE: Coursers, Pratincoles

Cursorius cursor cursor (Latham): Cream-colored Courser

PLATE 4 (bottom)

A series of seven breeding specimens, four males and three females, were collected between March and June by Forbes-Watson. The narrow subterminal black bands on the tail, the wide dark margins on the inner webs of the secondaries, and the large wing measurements (145 to 157 mm.) are all characters associated with the nominate form.

Adults: soft parts: iris dark brown; bill blackish, paler at base; feet white, soles creamy. Stomach contents: seeds, insects, and grit. Weight 100 gms. Juvenal male: some parts: iris brown; bill pale fawn, tip greyish; feet creamy white; bare patch at base of throat pink grey. Stomach contents: grasshoppers. Weight 60 gms. Downy young: soft parts: iris brown; bare patch at base of neck slaty; bill pinkish brown; egg tooth chalky white. Stomach contents: grasshoppers. Weight 13 gms. These birds were common just east of Hadibu and on the Ras Kharma airstrip, and also near Eriosh.

Regarding the breeding behavior of the cream-colored courser, Forbes-Watson made the following observations:

After a while the presumed female squatted, moved slightly, and again squatted with hunched back and depressed tail and head. The presumed male approached and pattered with its feet near the other bird's tail and mounted, but did not mate. He then jumped off to one side and 'scooped' at her rapidly with his head—this he did several times. They then went off together, and she squatted several more times, but as if on eggs and with head up, and he did not attempt to mount again.

Several call notes were written down on the spot and are recorded as follows:

a parent calling to young made soft deep whistles "wheet"; the ground alarm "woot"; flight-call "qwut" and "kwit"; in flight "werrau," "mraau" and "wit." In flight the birds look noticeably deep-chested and wide-winged with the head drawn back.

Family LARIDAE: Gulls, Terns

Larus species

Gulls were not generally common but were noted in small numbers all along the north coast. The following species were observed by Forbes-Watson: herring gull, *Larus argentatus* subspecies?; lesser black-backed gull, *Larus fuscus* subspecies?; white-eyed gull, *Larus leucophthalmus* Temminck; and sooty gull, *Larus hemprichii* (Bruch). All but *leucophthalmus* were observed on Abd-el-Kuri also. Ogilvie-Grant and Forbes (1903, pp. 55, 62, 63) reported both *Larus argentatus* and *Larus fuscus* from Abd-el-Kuri but only one species, *Larus argentatus*, from Socotra.

Sterna repressa Hartert: White-cheeked Tern

A pair were seen by Forbes-Watson in early June on the sandbar at the mouth of Kallansiya Lagoon; the next day there were four in the same place, but they were not seen again.

Sterna bengalensis subspecies: Lesser Crested Tern

These terns were seen fishing with *Sterna bergii* at both Qadhub and Kallansiya.

Sterna bergii subspecies?: Swift Tern

The swift tern was the most common species along the north coast and on Abd-el-Kuri. Ogilvie-Grant and Forbes (1903, pp. 55, 62) also report it from both these localities.

Sterna albifrons subspecies?: Little Tern

Regarding this tern, Forbes-Watson made the following comments in his field notes:

The only examples of *Sterna albifrons* seen were a few pairs being harried by a pair of ravens in late May near Eriosh. These birds were flying inland for about a mile and had just started to make scrapes in the gravel. Most of these scrapes seemed to have white shell fragments (mollusc) nearby. The presumed males were seen offering small silver fish to their mates with wing-lifting and raised crests. This was often done near a scrape, but in many cases was on the bare plains, and often the fish was not accepted, even after many attempts and from

several places; in such cases the female might fly off towards the sea, and the male would either swallow the fish, or persist in following her.

***Anous stolidus* subspecies?: Noddy**

A noddy was seen by Forbes-Watson on Ras Hebak in late May.

Family PTEROCLIDIDAE: Sandgrouse

***Eremialector lichtensteinii lichtensteinii* (Temminck):
Lichtenstein's Sandgrouse**

Six males and five females were collected at Qaysuh in June. Soft parts: iris brown; eye-ring yellow; lid tinged green; bill orange yellow; feet pale yellow. Females averaged slightly paler. Stomach contents: seeds and grit. Weight 100 gms. Forbes-Watson noted these birds only on the Hadibu Plain and on the limestone slopes near Kallansiya: "They seem to prefer fairly thick cover, but when the nests are exposed they are most difficult to find. The sitting birds and eggs are beautifully camouflaged."

Family COLUMBIDAE: Pigeons, Doves

***Streptopelia senegalensis senegalensis* (Linnaeus): Laughing Dove**

A series of eight males and five females were collected near Hadibu, at Qaysuh, and in the Haggier Mountains. Wing length 127-135 (131.6) in eight males and 121-131 (126.8) in five females. Soft parts: iris brown; eye-ring dull maroon; bill and cere black; feet dull maroon. Stomach contents: seeds. Weight: males 79-98 gms., females 70-80 gms.

The Laughing Dove was very common in most places and especially numerous in the date groves near Hadibu and Qaysuh. Nesting was noted in all months during the expedition's stay on Socotra. Many nests were found in boxwood bushes, placed about eight feet from the ground and were typical small twig saucers. In the Haggiers, a nest was found in a thorny tree about 20 feet from the ground.—A. D. Forbes-Watson.

***Oena capensis capensis* (Linnaeus): Namaqua Dove**

Hartlaub (1881, p. 956) reports a male collected by Riebeck at Gollonsir: "Iris dark brown, feet red."

***Treeron waalia* (Meyer): Bruce's Green Pigeon**

Three males, eight females, and one juvenal were collected at Hadibu in June and at Kishin and in the Haggier Mountains in April. Soft parts of adults: iris: outer ring bright blue, inner ring

pale green; bare skin around eye blue grey; cere dull greyish maroon; bill white, base maroon; feet bright yellow. Females have soft parts generally paler. Stomach contents: fig pulp. Weight 100 gms.

The juvenal specimen had the iris green grey; eye-ring blue grey; bill whitish, base blue grey; cere blue grey; feet pale yellow. Weight 97 gms.

These birds were not particularly common, but were seen near Kishin, especially in fruiting figs, and also in the palm groves near Hadibu where they were eating green dates. Call notes were written as follows: "u-vu," a rising near-whistle, or "ki-yoo," sometimes two in succession, or a rising and falling "u-wu-u!"—A. D. Forbes-Watson.

Family CUCULIDAE: Cuckoos

Centropus superciliosus sokotrae C. Grant: Socotra Coucal

A good series of four males and three females was secured on the Hadibu Plain and in the Haggier Mountains and foothills in March, April, and May. Soft parts: iris red; bill black; feet blue grey. Stomach contents: grasshoppers. Weight 100 gms.

Five specimens are in adult plumage. The nape and upper back are streaked with white and the tail feathers are greenish black over half their length. Another specimen has the nape and upper back streaked with white but the tail has the barrings usually associated with the immature plumage. Still another specimen has the brown and black head markings of the immature, but the incoming rectrices are greenish black. Friedmann (1930, p. 283) has commented on the variation in the color of the rectrices in immature birds of this species.

With regard to the order of molt of the remiges, several specimens occur in our series from Socotra which have new feathers appearing among the middle primaries, but no sequence of molt is discernible.

This species was not very common and was confined to water courses and their environs. They were rare in the palm groves on the coastal plain but more common in the Haggiers. Forbes-Watson reports the call note of a pair flying to a roost in late evening as a quiet clicking "te-tu." No evidence of breeding was noted.

Family STRIGIDAE: Owls

Otus scops socotranus (Ogilvie-Grant and Forbes): Socotra Scops Owl

Three males, three females, and one with sex undetermined were taken at Kishin at 2000 feet, and one male at Hadibu between April 16 and May 17. None were in breeding condition although one female

had slightly enlarged ovaries on April 19. One female is in body down though fully fledged. Soft parts: iris bright yellow; bill black; feet grayish; soles yellowish white. Wing: males 124-130; females 133-135 mm. Weight: males 64, 70, 78, 85; females 71, 74; immature female 72 gms. Stomach contents: grasshoppers, one centipede, two lizards.

Owls were noted by Forbes-Watson in the Haghiers and at Hadibu and Qaysuh. The first one seen was behaving more like a nightjar than an owl. It was flying out from a perch and back again in the twilight and appeared to be catching moths (although these insects were not found in the stomach contents after the bird had been collected and examined the next evening).

Ogilvie-Grant and Forbes (1903, p. 45) mention having heard the call on several occasions of a distinctly different species of owl (*Strix?* species) but were unsuccessful in obtaining a specimen.

Family CAPRIMULGIDAE: Nightjars, Goatsuckers

Caprimulgus nubicus jonesi (Ogilvie-Grant and Forbes):
Socotran Nightjar

This endemic nightjar was described from a specimen shot in the Dimichiro Valley in the Garieh Plain, east Socotra. It was not seen in 1964.

Family APODIDAE: Swifts

PLATE 5 (top)

Apus pallidus berliozii Ripley

In April, Forbes-Watson found flocks of smaller swifts flying about the hills and cliffs of the Haghier Mountains. An examination of 20 males and 11 females collected here and at Hadibu and Kallansiya shows that they represent a hitherto undescribed subspecies (Ripley, 1966, p. 101). Nearly all of these birds were in breeding condition.

Certain aspects of the courtship behavior of this new race have been recorded in some detail by Forbes-Watson:

In the flocks most birds were in pairs, one bird closely following the other. When collected, the leading bird was invariably the female, the following, the male. Much screaming was indulged in at such times as the birds swooped about; on a few occasions birds were seen to cling to their partner in the air, then they would drop with wings flexed, to break apart again only when they neared the ground. Several times birds were heard to make "whip-crack" noises in the air. This consisted of several rapidly-repeated slaps and the bird appeared rather

stiff when this occurred—presumably the noise was made by the wings, either slapping together or actually cracking like a whip; this may have been some form of sexual display. Birds were seen at the high pink cliffs in the Hagghiers, and were almost certainly breeding in cracks in the cliffs.

In March, Forbes-Watson observed large black swifts with pale throats flying near Hadibu, Kallansiya, and the west end of Abd-el-Kuri. None were collected but they were thought to be *Apus apus*.

Family CORACIIDAE: Rollers

Coracias garrulus garrulus Linnaeus: European Roller

A female was taken near Hadibu on March 15. It agrees in the color of the upperparts with a single winter-taken specimen of *garrulus* in the National Collection. Soft parts: iris brown; bill black; tail dull yellow. Stomach contents: grasshoppers. Weight 100 gms.

Coracias abyssinica Hermann: Abyssinian Roller

"I [Forbes] picked up on Abd-el-Kuri a skeleton of *Coracias*, of which I brought away the skull, which, on comparing it with a specimen in the British Museum, agreed exactly with this species"—Ogilvie-Grant and Forbes (1903, p. 61).

Family UPUPIDAE: Hoopoes

Upupa epops Linnaeus: Hoopoe

Ogilvie-Grant and Forbes (1903, p. 61) report a hoopoe sighted at sea near Abd-el-Kuri.

Family ALAUDIDAE: Larks

Eremopterix nigriceps forbeswatsoni, new subspecies

PLATE 5 (bottom)

Type.—United States National Museum No. 518056, adult male, collected Mar. 13, 1961, by Alec D. Forbes-Watson, 4 miles east of Hadibu, Socotra.

Diagnosis.—Similar to *E. n. melanauchen* (Cabanis) of the adjacent African mainland, but having the upperparts more rufous, less brown, particularly on the edgings of the inner secondaries and the middle rectrices. The white patch on the forehead extends farther back from the base of the upper mandible to crown than in neighboring populations (6.5 mm., average of 14 specimens from Socotra, vs. 4.6 mm., average of 5 specimens from Ethiopia, Eritrea, and

Somaliland, and 5.3 mm., average of 3 specimens from Aden). The Socotran series differs further from the Arabian form, *sincipitalis* (Blyth), in being decidedly darker above and having the upperparts more rufous brown, less sandy grey. Females are indistinguishable from those of other races.

Soft parts.—Iris brown; bill whitish; feet white flesh.

Weight.—15 gms.

Range.—Island of Socotra only.

Remarks.—

This was one of the commonest birds on the plains. It was usually found in flocks of from half-a-dozen to about fifty birds which would rise up just ahead of one and settle some way off. The favorite habitat on the plains was where the very shortest bushes grew. At Kallansiya, where the bush is taller, only two pairs were seen. They were often seen drinking in the heat of the day at the freshwater pond a mile to the east of Hadibu, and those seen at Kallansiya were drinking at the brackish lagoon there.—A. D. Forbes-Watson.

Calandrella cinerea subspecies?: Short-toed Lark

A single specimen in rather worn plumage was collected on the west end of Abd-el-Kuri on March 21. It is one of the paler south-west Asian forms and Mrs. B. P. Hall of the British Museum, to whom we are indebted for her courtesy in examining this specimen, suggested that it may possibly be *artemisia* Banjkovski, but the race cannot be identified with certainty. Soft parts: iris brown; bill brown horn; feet flesh brown. Wing 94 mm. Culmen 13.5 mm. Weight 19 gms. Stomach contents: insect fragments and a few seeds.

Family HIRUNDINIDAE: Swallows

Ptyonoprogne obsoleta arabica (Reichenow): Pale Gray Martin

Forbes collected several specimens of the pale gray martin in the Hagghiers during the 1898-99 expedition. The present series consists of two males and two females collected at Adho Dimellus in May. The males have wing measurements of 110 mm. The females are somewhat larger, having wing length ranging from 113 to 115 mm. Soft parts: iris brown; bill black; base of lower mandible yellowish; gape and palate yellow; feet dusky, soles white. Stomach contents: beetles. Weight 13-14 gms.

Hirundo rustica rustica Linnaeus: Swallow

One female was collected by Forbes-Watson near Hadibu on May 17. The underparts are white with only a slight trace of pinkish buff. Weight: 17 gms.

***Riparia riparia riparia* (Linnaeus): Sand Martin**

This Palearctic migrant may be added to the list of Socotra birds based on two males and one female collected near Hadibu in May 1964. Weight 11-13 gms.

***Delichon urbica* subspecies?: House Martin**

Forbes-Watson reports having seen this martin on several occasions in mid-May flying over Hadibu town.

Family LANIIDAE: Shrikes

***Lanius elegans uncinatus* Sclater and Hartlaub: Socotra Shrike**

PLATE 6 (top)

Fourteen males and 12 females of the Socotra shrike were collected at or near Hadibu, near Kallansiya, and in the Hagg hier Mountains. Wing lengths 97-104 (100.7) in 14 males and 92-103 (98.5) in 17 females. Weight 50-60 gms. Stomach contents: mostly grasshoppers but also centipedes and small lizards. Forbes-Watson reports this bird to be common and conspicuous, occurring from sea level to at least 4500 feet.

Family STURNIDAE: Starlings

***Onychognathus frater* (Sclater and Hartlaub): Socotra Chestnut-winged Starling**

Eight males and nine females of this endemic species were collected near Hadibu, Kallansiya, and Kishin, in the Hagg hier Mountains. This is a longer billed, shorter tailed species with no sexual dimorphism in color. Wing length 157-163 (159.5) in seven males and 148-156 (151.5) in nine females. Tail 139-146 (141.8) and 127-136 (131.2). Culmen from feathers 28-32 (29.2) and 27-29 (27.8). Soft parts: iris chestnut brown; bill and feet black. Weight 100 gms. Stomach contents: largely green fig pulp and grasshoppers. (Critical comments on the sympatric distribution of this species and *O. blythii* are discussed on p. 7.)

***Onychognathus blythii* (Hartlaub): Brown-winged Starling**

PLATE 6 (bottom)

Fourteen males, eight females, and one sex unknown, were secured during the 1964 expedition near Hadibu and Kishin in the Hagg hier. This is the shorter billed, longer tailed species with pronounced

sexual dimorphism in color. Wing length 165-175 (171.0) in 10 males and 155-164 (159.2) in 7 females. Tail 172-190 (177.0) and 155-169 (163.2). Culmen from feathers 23-25 (24.3) and 22-24 (22.6). Soft parts: iris chestnut brown; feet and bill black. Stomach contents: beetles, large black seeds. Weight 100 gms. This species was also found on Abd-el-Kuri.

Family CORVIDAE: Crows

Corvus ruficollis ruficollis Lesson: Brown-necked Raven

One female was secured on April 17 from the Haggier Mountains. It was one of a pair, but no signs of breeding were noted. Stomach contents: bones of a reptile. Weight 150 gms.

Family MUSCICAPIDAE: Insect Eaters

Subfamily SYLVIINAE: Warblers

Sylvia communis subspecies?: Whitethroat

Ogilvie-Grant and Forbes (1903, p. 59) report one specimen having been obtained on Abd-el-Kuri.

Phylloscopus collybita subspecies?: Chiff-Chaff

Ogilvie-Grant and Forbes (1903, p. 59) secured a single example on Abd-el-Kuri.

Cisticola incana Sclater and Hartlaub: Socotra Warbler

Forbes-Watson collected a fine series of these lively little warblers that are endemic to the island of Socotra. The bird, in plumage pattern and wing formula, closely resembles *C. fulvicapilla* from southern Africa. It is, however, very pale fulvous brown on the upper parts, with a slightly paler, faintly tawny head (the tawny tone varies, being absent in some specimens) and darker, blackish-brown tail. The tail has terminal white tips on the under surface, the lateral tail feathers in some specimens having subterminal white bars on the inner web. The primaries are dark brown with whitish outer edges. Wing length 49-53 (50.8) in 12 males and 46-51 (48.5) in 10 females. Tail 43-48 (45.2) and 41-47 (43.1). Some parts: iris tawny; eye-ring brown; bill black and pale brown; feet pinkish to orange flesh. Stomach contents: insects. Weight 9-12 gms. This bird was found on the plains near the foothills and up to at least 4500 feet in the Haggiers, and also on the more thickly covered plains at Ras Kharma and Kallansiya.

Cisticola juncidis haesitata* (Sclater and Hartlaub): Socotra *Cisticola

This is an endemic subspecies found only on the island of Socotra. It has the same wing formula and plumage pattern as *juncidis* and appears merely paler, more washed out in plumage. The 1964 expedition was fortunate in obtaining five males and one female in March and April. Wing length 45-50 (47.6) in five males and 43 in one female. Soft parts: iris tawny; bill blackish with cutting edge of upper and lower mandible yellowish to pale yellowish horn; feet pale flesh. Stomach contents: insects. Weight 6-8 gms. Ogilvie-Grant and Forbes (1903, p. 41) say that the adult males have the inside of the mouth bluish black while the females have this part flesh colored.

In his field notes, Forbes-Watson has recorded the following observations:

This species is by no means common, and was only found in two localities—one and one-half miles to the west of Hadibu, just below the foothills of Ras Hebak in light scrub, and a family group at 2800' on the upland meadow near Adho Dimellus. These latter were seen on the two days April 16 and 17; the habitat here was short grass with clumps and scattered bushes, with a stream flowing through. The birds also foraged just over the edge of this plateau, where the bush was thicker. The male sang from the top of these or in flight; this was an emphatic and abrupt "chit! . . . chit! . . . chit! . . .," etc., regularly spaced at around one-half second intervals; there was also a quick and subdued "titititi . . ." after alighting or at the end of a song from a bush. Apart from this family group of two parents and three young, no signs of breeding were noted. The other birds were foraging in the bushes, but at a lower level (in the bush) than was normal for *incana*, and it is doubtful if the two species compete much.

Subfamily TURDINAE: Thrushes, Wheatears

***Oenanthe deserti oreophila* (Oberholser): Desert Wheatear**

Nine females and one male were collected near Hadibu in March. Another male was collected during the same month on Abd-el-Kuri. Although Vaurie (1959, p. 347) lists *atroglularis* as occurring on Socotra in migration, the large wing measurements (100 mm. in both) and the large white area in the wing touching the shaft indicate that they should be placed with the more southerly race *oreophila*. Soft parts: iris brown; bill black; feet black. Stomach contents: insects. Weight: males 20-23 gms., females 20-27 gms.

***Oenanthe isabellina* (Temminck and Langier): Isabelline Wheatear**

One specimen of this chat was collected on Socotra by Professor Balfour (Sclater and Hartlaub, 1881, p. 167).

Family MOTACILLIDAE: Wagtails, Pipits

***Motacilla alba dukhunensis* Sykes: White Wagtail**

A series of two males and five females collected in March near Hadibu have the upperparts considerably paler than nominate *alba* and are closest in this respect to *dukhunensis*. Their measurements, however, were consistently smaller than those usually given for *dukhunensis*: wing 80-85 mm., tail 81-87 mm., culmen 10-11 mm., tarsus 21.5-23 mm. Soft parts: iris brown; bill black; feet black. Stomach contents: insects. Weight 18-29 gms.

***Budytes flavus* subspecies?: Blue-headed Yellow Wagtail**

Professor Balfour obtained three specimens of the blue-headed yellow wagtail (Sclater and Hartlaub, 1881, p. 168), but neither Forbes nor Forbes-Watson observed it on Socotra.

***Anthus campestris campestris* (Linnaeus): Tawny Pipit**

Ogilvie-Grant and Forbes (1903, p. 60) saw a pair on Abd-el-Kuri and secured a male.

***Anthus similis sokotrae* Hartert: Socotra Long-billed Pipit**

PLATE 7 (top)

Both Ogilvie-Grant and Forbes (1903, p. 60) and Forbes-Watson recorded the long-billed pipit as common and generally distributed over all parts of the island. A large series of 33 specimens were taken between March and June. Soft parts: iris brown; bill blackish horn; feet yellowish to orange flesh. Stomach contents: insects generally; one stomach contained a scorpion pincer. Weight: male 26-35 gms.; female 25-31 gms. This species was not noted on Abd-el-Kuri.

Family NECTARINIIDAE: Sunbirds

***Cyanomitra balfourii* (Sclater and Hartlaub): Socotra Sunbird**

A total of 33 sunbirds were collected near Hadibu and in the Haggier Mountains. Soft parts: iris orange brown; bill and feet black. Stomach contents: insects, fruits, and seeds. Weight 8-15 gms.

Since little is known of the life history of this endemic species, the detailed observations made by Forbes-Watson and recorded in his field notes are quoted in full:

This is another species with a large altitudinal range, occurring from sea-level to at least 4500'. It is found in ones or twos or small family parties and groups in any place where there is sufficient vegetation—they prefer fairly reasonably-sized trees and bushes, and so are most numerous in the hills, both in the Haghiers and on the foothills, and are not found on the bare limestone plateaux. Nor are they to be seen on the Hadibu plains proper, but they do occur in the thicker cover of the Kallansiya plains. Their call notes are typical of the family, and the song is a very quick cascading tinkle of characteristic sunbird-like notes.

Unlike sunbirds in Africa, this species was not seen to visit flowers at all, so nectar probably figures little in their diet. Most food was collected as the birds hopped about in the branches of trees and shrubs, and insects were seen to be picked off leaves and twigs, and were also caught in aerial flight. Occasionally birds would fly down onto bare ground to catch an insect. Insects were the main food but were mostly unidentifiable; one bird had a small cicada in the bill when shot, and another together [sic] with a small crab-spider in the throat. But vegetable matter was also an important item; this consisted of small fruits, fruit-stones and seeds, the commonest of these latter being large oval black seeds, and a flat seed was found in one stomach. An immature bird was seen picking fruits off a *Euphorbia* bush near Qaysuh, and had great difficulty in swallowing them, but managed eventually after a great deal of head-stretching and gasping.

Several stages in the breeding cycle were noted, but always too late to find the eggs, so they still remain unknown. In mid-April an empty nest was found at c. 1500' in the Haghiers, which, a day or two later, was half torn apart. The young were found in an identical nest on May 1, at 3100' near Adho Dimellus. This nest was found while a pair of agitated Sunbirds were being watched, when the male soon took food in his bill to feed the young, which were just ready to fly, and were waiting side by side in the nest with their bills on the edge of the entrance. One flew when approached, but the other was collected; this was a male with very small testes, and weighed 8 gms.; it had a brown iris (not orange brown as in the adult), bill with the upper mandible blackish, lower pale yellowish, except for the edges at the base, which were dusky, gape pale yellow, palate orange-yellow, feet dark greyish with paler soles. Insect fragments were the only contents of the stomach.

As with the other nest, this one was built at the base of a small vertical cliff (but another old nest, near Qaysuh, had no such protection), and was not suspended as in most species of the family, but was surrounded by branches and was not hanging free. It was built *in* the top of a small bare twiggy tree around 8 feet above the ground, and the entrance faced towards the cliff. The nest, which was collected, was a small inconspicuous structure of typical sunbird form; it was neat and frail, and was not suspended, but was supported at top and sides by small branches which were incorporated into the walls. It was a pear-shaped purse with a rather large oval entrance topped by a short indefinite porch of plant-down. The overall height was around 80 mm.; greatest depth from front to back around 60 mm.; greatest width (near the bottom) around 55 mm.; the entrance was around 40 mm. in height, around 24 mm. wide near the top and around 20 mm. wide near the bottom. The lining was of silky plant-down, rather patchy in parts (especially at the attachments), and this was surrounded and bound together with fine greyish twiglets, grass, etc., and cobwebs, with a few dead leaves and one spider egg-case on the exterior. All this blended in very well with the surroundings.

Young birds were seen being fed by a parent on a few occasions, when the young solicited with quivering wings and querulous calls—in each of these cases only one young was noted. The clutch, therefore, may usually be only one, with the occasional around two, but this data is insufficient, and these single birds may be the survivors of a larger brood. In any case, it is probably not ever more than two, which is the normal clutch-size in African sunbirds.

Display was only seen once, when a male was singing sustainedly from the top of a tree, with his yellow pectoral tufts spread widely. Chases, presumably territorial, were often noted, but, although known pairs were watched for long periods, no other signs of nuptial activity were seen.

Family ZOSTEROPIDAE: White-eyes

Zosterops abyssinicus socotranus Neumann: Socotra White-breasted White-eye

Plate 7 (bottom)

With the exception of one bird taken near Kallansiya, all of the 35 additional specimens of this endemic subspecies were taken in the Haggier Mountains. Soft parts: iris tawny; bill dusky; feet blue grey. Stomach contents: small fruits and seeds. Weight 8-15 gms.

The flock call is a thin descending whistle "seeoo," and this noise is one of the commonest and most characteristic sounds in the mountains. These birds have a peculiar habit of sipping water from a thin smear on the rocks rather than drinking from the pool below. The Bedu catch and eat a certain number, but apart from this, no predation of the species was noted.—A. D. Forbes-Watson.

Family PLOCEIDAE: Sparrows, Weavers

Passer insularis insularis Sclater and Hartlaub: Socotra Sparrow

Plate 8 (top)

We would place this species in a superspecies with *iagoensis* as it is distinctly patterned on the upper parts, lacking any brown except for the buffy-tawny superciliary and shoulder patch. A series of 51 Socotra sparrows were collected on the main island. Weight 20-35 gms. Wing length 72-78 (75.2) in 28 males and 68-78 (73.7) in 23 females.

This species was widespread and abundant. It probably breeds throughout the year. A nest in a house at Hadibu was occupied successively from early March to late June. Certainly two broods were successfully reared, and a male sparrow, perhaps the original builder of the nest, pulled it apart and rebuilt it in another site in the same ceiling when the first brood had flown. Other sites were noted—several in holes in the trunks of *Adenium* and Dragon's Blood Trees, a few in holes in rock, the formation of limestone being particularly suitable, and one untidy nest was found in a thorny tree. All the accessible ones were empty, so the eggs are still unknown, but, as three young were seen from the nest in the house at Hadibu, the clutch can be presumed to be at least three.

Away from habitations, the birds go about in flocks of varying sizes, the largest being seen at Qaysuh, where 50 or so were commonly seen together, and they reminded one strongly of weavers in Africa—was it such a flock that Balfour mistook for weavers as no other observer has noted any species of weaver on any of the islands.—A. D. Forbes-Watson.

***Passer insularis hemileucus* Ogilvie-Grant and Forbes:
Abd-el-Kuri Sparrow**

Seven of the pale sparrows (four males and three females) were collected on Abd-el-Kuri. This form has a marked white band below the buff shoulder patch. Stomach contents: vegetable matter. Weight 20-25 gms. Wing length 71-74 (72.7) in four males and 67-71 (69.0) in one female. Ogilvie-Grant and Forbes (1903, p. 58) found them only in the hills, where they were very wild. Forbes-Watson made a similar observation upon his arrival on Abd-el-Kuri, but later found them behaving much like *P. domesticus* about a small settlement on the north coast. Since there is no surface water on the island, it is difficult to understand how these birds survive in this inhospitable environment.

Family FRINGILLIDAE: Finches

***Rhynchostruthus socotranus socotranus* Sclater and Hartlaub:
Golden-winged Grosbeak**

With the exception of 1 male collected near Kallansiya, the remaining specimens (10 females, 20 males, and 4 unsexed) were all collected in the Haggliers. The skull of our anatomical specimen, examined by Dr. Richard Zusi, bears a strong resemblance to the pine grosbeak and to the New World evening grosbeaks, which are in themselves members of the cardeuline assemblage linked to the Palearctic and Himalayan rose finches. As Ripley stated (*in* Ripley and Rabor, 1961, p. 16), *Rhynchostruthus* bears a certain resemblance to *Rhodopechys*. We feel that this finch is related as a relict to the Himalayan fauna in the same way that some Arabian species seem so related (Ripley, 1954, p. 246). Soft parts: iris brown; bill blackish; feet pale brown flesh. Stomach contents: seeds, fruit pulp, and other vegetable matter. Weight 25-39 gms. Wing length 85-91 (88.4) in 20 males and 81-86 (83.7) in 10 females. Tail 50-55 (52.2) and 47-52 (49.2). Culmen 14-17 (15.5) and 14-15 (14.4).

Forbes-Watson observed these birds in the Hagglier Mountains and has written the following notes concerning their behavior:

Where they are found they are not uncommon, but can easily be missed, as they are shy and inconspicuous and feed in restricted areas. Their daily routine is as follows: in the early morning they descend from the highest parts of the

Hagghiers, where they probably roost in the thickets at 4500' or so. They fly down the valleys in loose flocks, flying very fast with a dipping flight, and often not alighting till they reach the feeding grounds, which may be as far down as 500' above sea-level. Here they feed on berries and rest until evening, when they return as they came.

Regarding their feeding habits, he says further:

The bird would clamber onto a bunch of small purple fruits (this was the favorite food) and pick off individual fruits, which would then be "mumbled" between the mandibles, and so much of the fleshy outside pulp was removed and dropped. This fruit is sticky, and the bills of all those birds collected were encrusted with this dried latex. The seeds were not crushed, however, as one would expect them to be from the enormous size of the bill, and were entire in all crops examined.

Family EMBERIZIDAE: Buntings

Fringillaria tahapisi insularis Ogilvie-Grant and Forbes: Cinnamon-breasted Rock-bunting

Twenty-five males and four females comprise this series taken by Forbes-Watson at or near Hadibu, near Kallansiya, and in the Hagghier Mountains. Soft parts: iris brown; bill dark dusky lemon; cutting edge and lower mandible yellowish; feet orange flesh. Stomach contents: small seeds. Weight 13-17 gms.

Fringillaria socotrana Ogilvie-Grant and Forbes: Socotra Mountain Bunting

Plate 8 (bottom)

With the exception of 3 birds (2 males and 1 female) taken in the Hagghiers, the remaining specimens in this series (11 males and 3 females) were taken near Kallansiya. Soft parts: iris brown; upper mandible dusky; lower yellowish; feet pale orange flesh. Stomach contents: small seeds and grit. Weight 13-16 gms.

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TABLE 1.—Some resident birds of Socotra and their habitats (+ = present, blank space = absent)

Species	Lowlands (0-200')					Highlands (200-4000')					Bleak limestone plateaus (1500-2000')	highlands Haggier peaks (4000-5000')
	shore	towns	lagoons and pools	man-groves (Goba)	plains	foothills	hill valleys	hill slopes	thickets	grassy uplands		
<i>Neophron percnopterus</i>	+	+	+	+	+	+	+	+		+	+	+
<i>Falco peregrinus</i>	+				+							+
<i>Falco tinnunculus</i>		+	+		+	+				+	+	+
<i>Buteo buteo</i>	+				+	+	+			+	+	+
<i>Pandion haliaetus</i>	+		+									
<i>Charadrius alexandrinus</i>	+		+									
<i>Cursorius cursor</i>			+		+							
<i>Eremialector lichtensteinii</i>			+		+							
<i>Streptopelia senegalensis</i>		+	+	+	+	+	+	+	+			
<i>Treron waalia</i>			+			+	+	+	+			
<i>Centropus superciliosus</i>			+				+	+	+			
<i>Otus scops</i>			+			+	+	+	+			
<i>Caprimulgus nubicus</i>					+							
<i>Apus pallidus</i>	+	+	+		+					+	+	+
<i>Eremopterix nigriceps</i>			+		+							
<i>Anthus similis</i>			+		+	+	+	+		+	+	+
<i>Cisticola incana</i>					+	+	+	+	+	+	+	+
<i>Cisticola juncidis</i>					+					+		
<i>Lanius elegans</i>		+	+		+	+	+	+	+	+		
<i>Corvus ruficollis</i>	+	+	+		+	+	+	+			+	+
<i>Onychognathus frater</i>		+	+		+	+	+	+	+	+		+
<i>Onychognathus blythii</i>		+	+		+	+	+	+	+	+	+	+
<i>Zosterops abyssinicus</i>			+		+	+	+	+	+	+		
<i>Cyanomitra balfouri</i>						+	+	+	+	+		
<i>Passer insularis</i>	+	+	+	?	+	+	+	+	+	+	+	+
<i>Rhynchostruthus socotranus</i>					(+)	+	+	+	+	+		
<i>Fringillaria tahapisi</i>		+	+		+	+	+	+	+	+		
<i>Fringillaria socotrana</i>					+							+



A dragon's blood tree and the Haghier Mountains on Socotra.



Haghier Mountains from the Hadibu Plain on Socotra.



West end of Socotra, the habitat of *Fringillaria socotrana*.



Village on Abd-el-Kuri in the area where *Passer insularis hemileucus* occurs.



Sula dactylatra melanops in flight.



Buteo buteo in flight.



Neophron percnopterus percnopterus.



Cursorius cursor cursor settling on eggs.



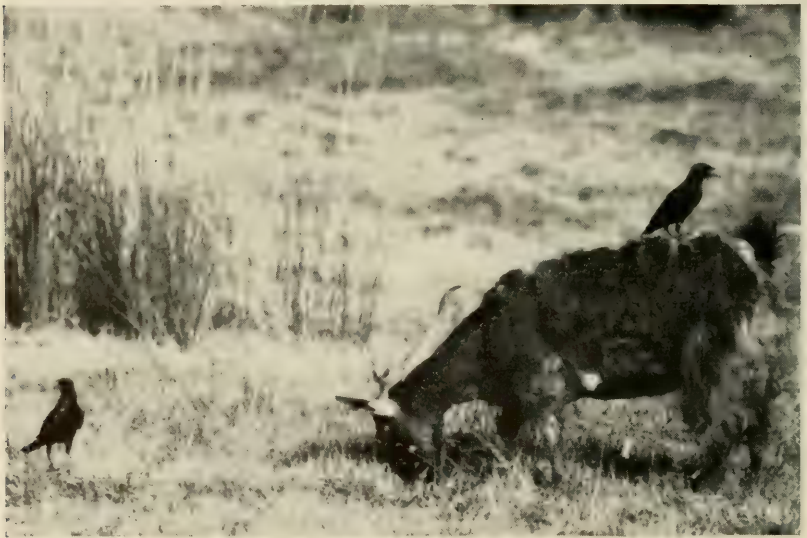
Swift in flight near Hadibu Town.



Male *Eremopterix nigriceps forbeswatsoni*.



Lanius elegans uncinatus.



Onychognathus blythii and an island goat.



Anthus similis sokotrae.



Zosterops abyssinicus socotramus.



Passer insularis insularis male at Hadibu.



Frigillaria socotrana.